

Rotating Cavitation Supression, Phase I

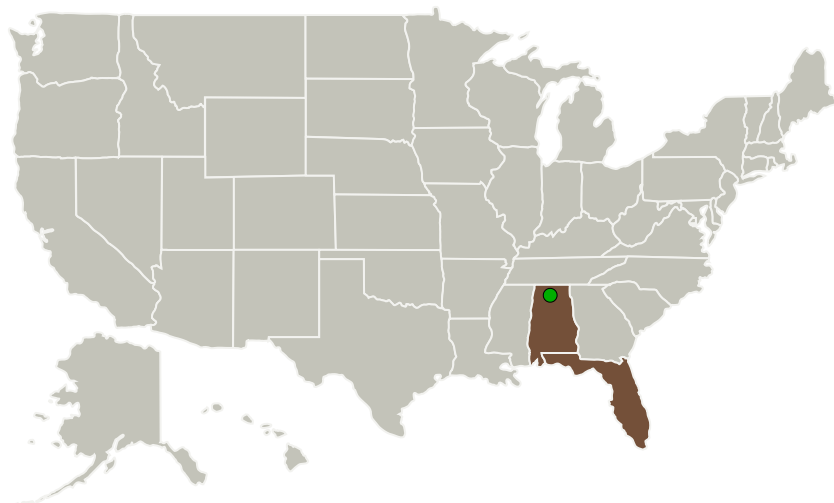
Completed Technology Project (2012 - 2012)



Project Introduction

FTT proposes development of a rotating cavitation (RC) suppressor for liquid rocket engine turbopump inducers. Cavitation instabilities, such as rotating cavitation, have caused severe damage to bearings and seals, fatigue failures, and even catastrophic failures of rocket engines. In addition, cavitation instabilities hamper suction performance, which prevents developments related to increasing payload by reducing overall vehicle weight with thinner propellant tank walls. An RC suppressor will allow for increased suction performance and for improved turbopump reliability by reducing loads on the rotor support system. This technology has applications for any rocket engine turbopump or commercial pump. FTT's approach will mature the conceptual design for the Slotted Annular Cavitation Suppressor (SACS), compare results of computational fluid dynamics (CFD) of a baseline inducer with and without the SACS, create a test plan, and generate a conceptual design of a test article to test the SACS. Phase I will advance this technology from TRL 2 to TRL 3. Phase II will culminate with water testing of the RC suppressor and data reduction, and will advance it to TRL 5.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Florida Turbine Technologies, Inc.	Lead Organization	Industry	Jupiter, Florida
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	Florida

Project Transitions

**February 2012:** Project Start**August 2012:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138475>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Florida Turbine Technologies, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Frank Huber

Co-Investigator:

Frank K Huber

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Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.1 Chemical Space Propulsion
 - └ TX01.1.3 Cryogenic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System